APPENDIX C

PLANT EMISSIONS INVENTORY

Table C-1. Potential Sources of Air Pollutant Emissions

Production Process	Stack Identification Code	POTENTIAL EMISSION GENERATING ACTIVITY							
		CO	NOx	SO2	TSP	PM-10	VOC	Lead	Toxic Air Pollutants
Boilers	Kipper Boiler	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion
Plant	Woodpile	None	None	None	Wind erosion and material handling	Wind erosion and material handling	Evaporation of volatile organic compounds	None	None
Boilers	Boiler 1	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion
Boilers	Boiler 2	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion
Process A	7020	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process A	7101	Fuel combustion	Fuel combustion	Fuel combustion and conversion of sulfite to SO2	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Fuel combustion	Fuel combustion	Fuel combustion
Process A	7102	Fuel combustion	Fuel combustion	Fuel combustion and conversion of sulfite to SO2	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Fuel combustion	Fuel combustion	Fuel combustion
Process A	7019	Fuel combustion	Fuel combustion	Fuel combustion and conversion of sulfite to SO3	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Fuel combustion	Fuel combustion	Fuel combustion
Process A	7001	None	None	Conversion of sulfite to SO2	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None
Process A	7027	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process A	7006	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process B	5034	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process B	5037	None	None	Conversion of sulfite to SO2	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None

* Particulate emissions from combustion are an insignifcant fraction of process particulate emissions.

Table C-1. Potential Sources of Air Pollutant Emissions

Production Process	Stack Identification Code	POTENTIAL EMISSION GENERATING ACTIVITY							
		CO	NOx	SO2	TSP	PM-10	VOC	Lead	Toxic Air Pollutants
Process B	4000	None	None	Conversion of sulfite to SO3	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None
Process B	228	Fuel combustion	Fuel combustion	Fuel combustion and conversion of sulfite to SO2	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Fuel combustion	Fuel combustion	Fuel combustion
Process B	234	Fuel combustion	Fuel combustion	Fuel combustion and conversion of sulfite to SO2	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Fuel combustion	Fuel combustion	Fuel combustion
Process B	311	None	None	Conversion of sulfite to SO3	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None
Process B	312	None	None	Conversion of sulfite to SO3	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None
Process B	410/411	None	None	Conversion of sulfite to SO3	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None
Process B	613/614	None	None	Conversion of sulfite to SO3	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None
Process B	615/616	None	None	Conversion of sulfite to SO3	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None
Process B	638	None	None	Conversion of sulfite to SO3	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	Entrainment of particulates in unit process exhaust and volatilization of condensible compounds	None	None	None
Process B	707	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process B	725	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None

* Particulate emissions from combustion are an insignifcant fraction of process particulate emissions.

Table C-1. Potential Sources of Air Pollutant Emissions

Production Process	Stack Identification Code	POTENTIAL EMISSION GENERATING ACTIVITY							
		CO	NOx	SO2	TSP	PM-10	VOC	Lead	Toxic Air Pollutants
Process B	8	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process B	5001	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process B	5000	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process B	432	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process B	322	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Process B	572	None	None	None	Entrainment of particulates in unit process exhaust	Entrainment of particulates in unit process exhaust	None	None	None
Plant	Heaters	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion	Fuel combustion
Plant	Plant Roads	None	None	None	Vehicle Traffic	Vehicle Traffic	None	None	None

* Particulate emissions from combustion are an insignifcant fraction of process particulate emissions.

Table C-2. Carbon Monoxide Emission Factors

Production Process	Stack Identification Code	Emission Factor	Units	Basis for Factor
Boilers	Kipper Boiler	0.927	lb CO/000 lbs steam	From 1994 Source Emission Evaluation Report. Emission factor is for 100% firing with wood waste.
Boilers	Boiler 1	0.08	lb CO/MMBTU	Based on AP-42, Table 1.4-1 (7/98), for uncontrolled combustion in boiler < 100 MMBTU/hr, and assuming 1020 BTU/scf.
Boilers	Boiler 2	0.08	lb CO/MMBTU	Based on AP-42, Table 1.4-1 (7/98), for uncontrolled combustion in boiler < 100 MMBTU/hr, and assuming 1020 BTU/scf.
Process A	7101	0.260	lb CO/MMBTU	General CO emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Process A	7102	0.260	lb CO/MMBTU	General CO emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Process A	7019	0.260	lb CO/MMBTU	General CO emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Process B	228	0.130	lb CO/MMBTU	General CO emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Process B	234	0.130	lb CO/MMBTU	General CO emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Plant	Heaters	0.082	lb CO/MMBTU	Based on AP-42, Table 1.4-1 (7/98), for uncontrolled combustion in boiler < 100 MMBTU/hr, and assuming 1020 BTU/scf. On an annual basis, firing assumed to occur at a maximum of 50% of burner capacity.

Table C-3. Estimated Carbon Monoxide Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Hourly Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	0.927	lb CO/000 lbs steam	60	000 lbs steam/hr	55.62	525600	lbs steam	243.6
Boilers	Boiler 1	0.082	lb CO/MMBTU	52	MMBTU/hr	4.28	455520	MMBtu	18.8
Boilers	Boiler 2	0.082	lb CO/MMBTU	35	MMBTU/hr	2.88	306600	MMBtu	12.6
Process A	7101	0.260	lb CO/MMBTU	6.50	MMBTU/hr	1.69	56940	MMBtu	7.4
Process A	7102	0.260	lb CO/MMBTU	6.50	MMBTU/hr	1.69	56940	MMBtu	7.4
Process A	7019	0.260	lb CO/MMBTU	6.60	MMBTU/hr	1.72	57816	MMBtu	7.5
Process B	228	0.130	lb CO/MMBTU	9.66	MMBTU/hr	1.26	84621.6	MMBtu	5.5
Process B	234	0.130	lb CO/MMBTU	6.44	MMBTU/hr	0.84	56414.4	MMBtu	3.7
Plant	Heaters	0.082	lb CO/MMBTU	30.80	MMBTU/hr	2.54	134904	MMBtu	5.6

Table C-4. Nitrogen Oxides Emission Factors

Production Process	Stack Identification Code	Emission Factor	Emission Factor Units	Basis for Factor
Boilers	Kipper Boiler	0.456	lb NOx/000 lbs steam	Based on 50% firing of boiler with coal. Emission factor is a combination of AP-42 estimate for subbituminous coal and 0.332 lb NOx/000 lbs steam reported in 1994 Source Emission Evaluation Report.
Boilers	Boiler 1	0.098	lb NOx/MMBTU	Based on AP-42, Table 1.4-1 (7/98), for uncontrolled combustion in boiler < 100 MMBTU/hr, and assuming 1020 BTU/scf.
Boilers	Boiler 2	0.098	lb NOx/MMBTU	Based on AP-42, Table 1.4-1 (7/98), for uncontrolled combustion in boiler < 100 MMBTU/hr, and assuming 1020 BTU/scf.
Process A	7101	0.051	lb NOx/MMBTU	General NOx emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Process A	7102	0.051	lb NOx/MMBTU	General NOx emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Process A	7019	0.051	lb NOx/MMBTU	General NOx emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Process B	228	0.026	lb NOx/MMBTU	General NOx emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Process B	234	0.026	lb NOx/MMBTU	General NOx emission factor developed from emission measurements of similar bar burners completed at the BAF Blackfoot Plant.
Plant	Heaters	0.098	lb NOx/MMBTU	Based on AP-42, Table 1.4-1 (7/98), for uncontrolled combustion in boiler < 100 MMBTU/hr, and assuming 1020 BTU/scf. On an annual basis, firing assumed to occur at a maximum of 50% of burner capacity.

Table C-5. Nitrogen Oxides Emissions

Production Process	Stack Identification Code	Emission Factor	Emission Factor Units	Operating Rate	Operating Rate Units	Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	0.456	lb NOx/000 lbs steam	60	000 lbs steam/hr	27.38	525600	lbs steam	119.9
Boilers	Boiler 1	0.098	lb NOx/MMBTU	52	MMBTU/hr	5.10	455520	MMBtu	22.3
Boilers	Boiler 2	0.098	lb NOx/MMBTU	35	MMBTU/hr	3.43	306600	MMBtu	15.0
Process A	7101	0.051	lb NOx/MMBTU	6.50	MMBTU/hr	0.33	56940	MMBtu	1.5
Process A	7102	0.051	lb NOx/MMBTU	6.50	MMBTU/hr	0.33	56940	MMBtu	1.5
Process A	7019	0.051	lb NOx/MMBTU	6.60	MMBTU/hr	0.34	57816	MMBtu	1.5
Process B	228	0.026	lb NOx/MMBTU	9.66	MMBTU/hr	0.25	84621.6	MMBtu	1.1
Process B	234	0.026	lb NOx/MMBTU	6.44	MMBTU/hr	0.16	56414.4	MMBtu	0.7
Plant	Heaters	0.098	lb NOx/MMBTU	30.80	MMBTU/hr	3.02	134904	MMBtu	6.6

Table C-6. Sulfuar Dioxide Emission Factors

	Stack	Process Related SO2 Emissions			Combustion Related SO2 Emissions		
Boilers	Kipper Boiler	0.00	NA	NA	0.8149	lb SO2/000 lbs steam	Based on 50% firing of boiler with 0.7 wt% S coal. Emission factor is a combination of AP-42 estimates for subbituminous coal and for wood waste combustion
Boilers	Boiler 1	0.00	NA	NA	0.0024	lb SO2/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf and 0.8 gr/Ccf sulfur content of natural gas.
Boilers	Boiler 2	0.00	NA	NA	0.0024	lb SO2/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf and 0.8 gr/Ccf sulfur content of natural gas.
Process A	7101	0.005	lb SO2/000 lb unit process throughput	Based on results of emission measurements completed on similar dryer at the BAF Blackfoot Plant.	0.0024	lb SO2/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf and 0.8 gr/Ccf sulfur content of natural gas.
Process A	7102	0.005	lb SO2/000 lb unit process throughput	Based on results of emission measurements completed on similar dryer at the BAF Blackfoot Plant.	0.0024	lb SO2/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf and 0.8 gr/Ccf sulfur content of natural gas.
Process A	7019	0.005	lb SO2/000 lb unit process throughput	Based on results of emission measurements completed on similar dryer at the BAF Blackfoot Plant.	0.0024	lb SO2/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf and 0.8 gr/Ccf sulfur content of natural gas.
Process A	7001	0.005	lb SO2/000 lb unit process throughput	Based on results of emission measurements completed on similar dryer at the BAF Blackfoot Plant.	0.0000	NA	NA
Process B	5037	0.11	lbs SO2/000 lbs product	Estimated 10% conversion of sulfite to SO2 within process.	0.0000	NA	NA
Process B	4000	0.065	lbs SO2/000 lbs product	Sum of emissions from stacks 4000, 228 and 234 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. Total process emissions allocated to these stacks based on portion of drying completed at each stage.	0.0000	NA	NA
Process B	228	0.042	lbs SO2/000 lbs product	Sum of emissions from stacks 4000, 228 and 234 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. Total process emissions allocated to these stacks based on portion of drying completed at each stage.	0.0024	lb SO2/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf and 0.8 gr/Ccf sulfur content of natural gas.
Process B	234	0.012	lbs SO2/000 lbs product	Sum of emissions from stacks 4000, 228 and 234 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. Total process emissions allocated to these stacks based on portion of drying completed at each stage.	0.0024	lb SO2/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf and 0.8 gr/Ccf sulfur content of natural gas.

Table C-6. Sulfuar Dioxide Emission Factors

	Stack	Process Related SO2 Emissions			Combustion Related SO2 Emissions		
Process B	311	0.030	lbs SO2/000 lbs product	Sum of emissions from stacks 311, 312, and 410/411 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. 25% of emission assigned to stack 311.	0.0000	NA	NA
Process B	312	0.030	lbs SO2/000 lbs product	Sum of emissions from stacks 311, 312, and 410/411 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. 25% of emission assigned to stack 312.	0.0000	NA	NA
Process B	410/411	0.059	lbs SO2/000 lbs product	Sum of emissions from stacks 311, 312, and 410/411 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. 50% of emission assigned to stack 410/411.	0.0000	NA	NA
Process B	613/614	0.060	lbs SO2/000 lbs product	Sum of emissions from stacks 613/614, 615/616, and 638 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. Emissions allocated to specific stacks in proportion to stack air flow.	0.0000	NA	NA
Process B	615/616	0.046	lbs SO2/000 lbs product	Sum of emissions from stacks 613/614, 615/616, and 638 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. Emissions allocated to specific stacks in proportion to stack air flow.	0.0000	NA	NA
Process B	638	0.013	lbs SO2/000 lbs product	Sum of emissions from stacks 613/614, 615/616, and 638 assumed to be the same as sum of measured emissions from stacks HEB and HNL at Blackfoot Plant. Emissions allocated to specific stacks in proportion to stack air flow.	0.0000	NA	NA
Plant	Heaters	0.00	NA	NA	0.0024	lb SO2/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf and 0.8 gr/Ccf sulfur content of natural gas. On an annual basis, firing assumed to occur at a maximum of 50% of burner capacity.

Table C-7. Sulfur Dioxide Emissions

Production Process	Stack Identification Code	Process Related SO2 Emissions					Combustion Related SO2 Emissions					Total SO2 Emissions	
		Process Emission Factor	Process Emission Factor Units	Hourly Operating Rate	Annual Operating Rate	Process Operating Units	Combustion Emission Factor	Combustion Emission Units	Hourly Combustion Rate	Annual Combustion Rate	Combustion Units	Combined Hourly Emission Rate, lb/hr	Combined Annual Emissions, tpy
Boilers	Kipper Boiler	0	NA	0	0	NA	0.8149	lb SO2/000 lbs steam	60	525,600	000 lbs steam	48.89	214.2
Boilers	Boiler 1	0	NA	0	0	NA	0.0024	lb SO2/MMBTU	52	455,520	MMBTU	0.12	0.5
Boilers	Boiler 2	0	NA	0	0	NA	0.0024	lb SO2/MMBTU	35	306,600	MMBTU	0.08	0.4
Process A	7101	0.005	lb SO2/000 lb unit process throughput	20.4	178704	000 lb unit process throughput	0.0024	lb SO2/MMBTU	6.5	56,940	MMBTU	0.12	0.5
Process A	7102	0.005	lb SO2/000 lb unit process throughput	20.4	178704	000 lb unit process throughput	0.0024	lb SO2/MMBTU	6.5	56,940	MMBTU	0.12	0.5
Process A	7019	0.005	lb SO2/000 lb unit process throughput	40.8	357408	000 lb unit process throughput	0.0024	lb SO2/MMBTU	6.6	57,816	MMBTU	0.22	1.0
Process A	7001	0.005	lb SO2/000 lb unit process throughput	5.1	44676	000 lb unit process throughput	0.0000	NA	0.0	0	NA	0.03	0.1
Process B	5037	0.110	lbs SO2/000 lbs product	17.0	148920	000 lbs product	0.0000	NA	0.0	0	NA	1.87	8.2
Process B	4000	0.065	lbs SO2/000 lbs product	4.0	35040	000 lbs product	0.0000	NA	0.0	0	NA	0.26	1.1
Process B	228	0.042	lbs SO2/000 lbs product	4.0	35040	000 lbs product	0.0024	lb SO2/MMBTU	9.7	84,622	MMBTU	0.19	0.8
Process B	234	0.012	lbs SO2/000 lbs product	4.0	35040	000 lbs product	0.0024	lb SO2/MMBTU	6.4	56,414	MMBTU	0.06	0.3
Process B	311	0.030	lbs SO2/000 lbs product	1.5	13140	000 lbs product	0.0000	NA	0.0	0	NA	0.05	0.2

Table C-7. Sulfur Dioxide Emissions

Production Process	Stack Identification Code	Process Related SO2 Emissions					Combustion Related SO2 Emissions					Total SO2 Emissions	
		Process Emission Factor	Process Emission Factor Units	Hourly Operating Rate	Annual Operating Rate	Process Operating Units	Combustion Emission Factor	Combustion Emission Units	Hourly Combustion Rate	Annual Combustion Rate	Combustion Units	Combined Hourly Emission Rate, lb/hr	Combined Annual Emissions, tpy
Process B	312	0.030	lbs SO2/000 lbs product	1.5	13140	000 lbs product	0.0000	NA	0.0	0	NA	0.05	0.2
Process B	410/411	0.059	lbs SO2/000 lbs product	1.5	13140	000 lbs product	0.0000	NA	0.0	0	NA	0.09	0.4
Process B	613/614	0.060	lbs SO2/000 lbs product	2.8	24528	000 lbs product	0.0000	NA	0.0	0	NA	0.17	0.7
Process B	615/616	0.046	lbs SO2/000 lbs product	2.8	24528	000 lbs product	0.0000	NA	0.0	0	NA	0.13	0.6
Process B	638	0.013	lbs SO2/000 lbs product	2.8	24528	000 lbs product	0.0000	NA	0.0	0	NA	0.04	0.2
Plant	Heaters	0	NA	0	0	NA	0.0024	lb SO2/MMBTU	30.8	134,904	MMBTU	0.07	0.2

Table C-8. Particulate Matter Emission Factors

Production Process	Stack Identification Code	Emission Factor	Units	Basis for Factor
Boilers	Kipper Boiler	0.276	lb PM/000 lbs steam	Based on 50% firing of boiler with coal. Emission factor is a combination of AP-42 estimate for uncontrolled combustion of subbituminous coal and 0.213 lb PM/000 lbs steam reported in 1994 Source Emission Evaluation Report. 74% scrubber efficiency applied to coal emission factor.
Plant	Woodpile	9.100	lb PM/hr	From AP-42, Section 10.3 (2/80) for sawdust handling at plywood veneer plant. Also assuming 5000 Btu/lb of wood, 1000 Btu/lb of steam, 60,000 lb steam/hr, and 65.9% boiler efficiency.
Boilers	Boiler 1	0.007	lb PM/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf.
Boilers	Boiler 2	0.007	lb PM/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf.
Process A	7020	0.018	lb PM/000 lbs unit process throughput	Based on Method 5 stack test results from February 1998.
Process A	7101	0.140	lb PM/000 lbs unit process throughput	Process and stack similarity to Stack DUT at Blackfoot Plant
Process A	7102	0.140	lb PM/000 lbs unit process throughput	Process and stack similarity to Stack DUT at Blackfoot Plant
Process A	7019	0.116	lb PM/000 lbs unit process throughput	Process and stack similarity to Stack DHZ at Blackfoot Plant
Process A	7001	0.053	lb PM/000 lbs unit process throughput	Process and stack similarity to Stack DSO at Blackfoot Plant
Process A	7027	0.015	lb PM/000 lbs unit process throughput	Process and stack similarity to Stack DSO at Blackfoot Plant
Process A	7006	0.005	lb PM/000 lbs production process output	Process and stack similarity to Stack DUY at Blackfoot Plant
Process B	5034	0.003	lb PM/000 lbs production process output	Process and stack similarity to Stack CHV at Blackfoot Plant
Process B	5037	0.101	lb PM/000 lbs production process output	Process and stack similarity to Stack CIR at Blackfoot Plant
Process B	4000	0.503	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 50% of process PM emission factor allocated to predryer.
Process B	228	0.320	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 25% of process PM emission factor assigned to this stack.
Process B	234	0.092	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 25% of process PM emission factor assigned to this stack.
Process B	311	0.228	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 25% of emission assigned to stack 311.
Process B	312	0.228	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 25% of emission assigned to stack 312.
Process B	410/411	0.458	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 50% of emission assigned to stack 410/411.

Table C-8. Particulate Matter Emission Factors

Production Process	Stack Identification Code	Emission Factor	Units	Basis for Factor
Process B	613/614	0.457	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; total process PM emission factor allocated in proportion to stack discharge air flows.
Process B	615/616	0.357	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; total process PM emission factor allocated in proportion to stack discharge air flows.
Process B	638	0.101	lb PM/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; total process PM emission factor allocated in proportion to stack discharge air flows.
Process B	707	0.000	lb PM/000 lb of unit process throughput	Process and stack similarity to Stack EUW at Blackfoot Plant. 90% PM removal assumed to occur in fabric filter.
Process B	725	0.0016	lb PM/000 lb of unit process throughput	Process and stack similarity to Blackfoot Stack CHI. 90% PM removal assumed to occur in fabric filter.
Process B	8	0.0016	lb PM/000 lb of product transported	Process and stack similarity to Blackfoot Stack CHI. 90% PM removal assumed to occur in fabric filter.
Process B	5001	0.016	lb PM/000 lb of product transported	Process and stack similarity to Blackfoot CHI.
Process B	5000	0.0016	lb PM/000 lb of product transported	Process and stack similarity to Blackfoot Stack CHI. Additional 90% PM removal assumed to occur in fabric filter.
Process B	432	0.0016	lb PM/000 lb of product transported	Process and stack similarity to Blackfoot Stack CHI. Additional 90% PM removal assumed to occur in fabric filter.
Process B	322	0.016	lb PM/000 lb of product transported	Process and stack similarity to Blackfoot Stack CHI.
Process B	572	0.150	lb PM/000 lb of product transported	AP-42, Table 9.9.1-1 (5/98) for Internal Vibrating Grain Cleaning with cyclone control selected as closest comparable process with emission factor.
Plant	Heaters	0.007	lb PM/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf. On an annual basis, firing assumed to occur at a maximum of 50% of burner capacity.
Plant	Plant Roads	17	lb PM/hr	AP-42 Section 13.2 used to estimate road emissions. Emission details in Appendix B data tables. Emission factor shown is for annual average.

Table C-9. Particulate Matter Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	0.276	lb PM/000 lbs steam	60	000 lbs steam/hr	16.59	525600	000 lbs steam/yr	72.6
Plant	Woodpile	9.100	lb PM/hr	NA	-	9.100	8760	hrs/yr	39.9
Boilers	Boiler 1	0.007	lb PM/MMBTU	52	MMBtu/hr	0.387	455520	MMBtu	1.7
Boilers	Boiler 2	0.007	lb PM/MMBTU	35.0	MMBtu/hr	0.261	306600	MMBtu	1.1
Process A	7020	0.018	lb PM/000 lbs unit process throughput	40.8	000 lbs throughput/hr	0.714	357408	000 lbs throughput/yr	3.1
Process A	7101	0.140	lb PM/000 lbs unit process throughput	20.4	000 lbs throughput/hr	2.856	178704	000 lbs throughput/yr	12.5
Process A	7102	0.140	lb PM/000 lbs unit process throughput	20.4	000 lbs throughput/hr	2.856	178704	000 lbs throughput/yr	12.5
Process A	7019	0.116	lb PM/000 lbs unit process throughput	40.8	000 lbs throughput/hr	4.733	357408	000 lbs throughput/yr	20.7
Process A	7001	0.053	lb PM/000 lbs unit process throughput	5.1	000 lbs throughput/hr	0.270	44676	000 lbs throughput/yr	1.2
Process A	7027	0.015	lb PM/000 lbs unit process throughput	5.1	000 lbs throughput/hr	0.077	44676	000 lbs throughput/yr	0.3
Process A	7006	0.005	lb PM/000 lbs production process output	40.8	000 lbs production process output	0.204	357408	000 lbs throughput/yr	0.9
Process B	5034	0.003	lb PM/000 lbs production process output	17.0	000 lbs production process output	0.051	148920	000 lbs throughput/yr	0.2
Process B	5037	0.101	lb PM/000 lbs production process output	17.0	000 lbs production process output	1.717	148920	000 lbs throughput/yr	7.5
Process B	4000	0.503	lb PM/000 lbs production process output	4.0	000 lbs production process output	2.012	35040	000 lbs throughput/yr	8.8
Process B	228	0.320	lb PM/000 lbs production process output	4.0	000 lbs production process output	1.280	35040	000 lbs throughput/yr	5.6
Process B	234	0.092	lb PM/000 lbs production process output	4.0	000 lbs production process output	0.368	35040	000 lbs throughput/yr	1.6
Process B	311	0.228	lb PM/000 lbs production process output	1.5	000 lbs production process output	0.342	13140	000 lbs throughput/yr	1.5
Process B	312	0.228	lb PM/000 lbs production process output	1.5	000 lbs production process output	0.342	13140	000 lbs throughput/yr	1.5
Process B	410/411	0.458	lb PM/000 lbs production process output	1.5	000 lbs production process output	0.686	13140	000 lbs throughput/yr	3.0
Process B	613/614	0.457	lb PM/000 lbs production process output	2.8	000 lbs production process output	1.280	24528	000 lbs throughput/yr	5.6
Process B	615/616	0.357	lb PM/000 lbs production process output	2.8	000 lbs production process output	1.000	24528	000 lbs throughput/yr	4.4
Process B	638	0.101	lb PM/000 lbs production process output	2.8	000 lbs production process output	0.283	24528	000 lbs throughput/yr	1.2
Process B	707	0.000	lb PM/000 lb of unit process throughput	30.4	000 lbs production process output	0.003	266304	000 lbs throughput/yr	0.0
Process B	725	0.002	lb PM/000 lb of unit process throughput	30.4	000 lbs production process output	0.049	266304	000 lbs throughput/yr	0.2

Table C-9. Particulate Matter Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Process B	8	0.002	lb PM/000 lb of product transported	30.4	000 lb of product transported	0.049	266304	000 lbs throughput/yr	0.2
Process B	5001	0.016	lb PM/000 lb of product transported	30.4	000 lb of product transported	0.486	266304	000 lbs throughput/yr	2.1
Process B	5000	0.002	lb PM/000 lb of product transported	30.4	000 lb of product transported	0.049	266304	000 lbs throughput/yr	0.2
Process B	432	0.002	lb PM/000 lb of product transported	30.4	000 lb of product transported	0.049	266304	000 lbs throughput/yr	0.2
Process B	322	0.016	lb PM/000 lb of product transported	30.4	000 lb of product transported	0.486	266304	000 lbs throughput/yr	2.1
Process B	572	0.150	lb PM/000 lb of product transported	5.0	000 lb of product transported	0.750	43680	000 lbs throughput/yr	3.3
Plant	Heaters	0.007	lb PM/MMBTU	30.8	MMBtu/hr	0.229	134904	MMBtu	0.5
Plant	Plant Roads	17	lb PM/hr	NA	lb/hr	17	8760	hrs/yr	74.5

Table C-10. PM10 Emission Factors

Production Process	Stack Identification Code	Emission Factor	Units	Basis for Factor
Boilers	Kipper Boiler	0.271	lb PM10/000 lbs steam	Based on 50% firing of boiler with coal. From AP-42, Sec. 1.6 (7/01), 98 percent of total TSP emitted from wood waste boiler using multiclones and wet scrubber is PM10. This percentage applied to both coal and wood related emissions.
Plant	Woodpile	2.275	lb PM10/hr	Assumed to be 25% of PM factor
Boilers	Boiler 1	0.007	lb PM10/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf. All PM assumed to be PM10.
Boilers	Boiler 2	0.007	lb PM10/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf. All PM assumed to be PM10.
Process A	7020	0.010	lb PM10/000 lbs unit process throughput	PM10 assumed to be 58.1% of TSP emissions. This fraction is the same as the fraction of solid PM that is PM10 measured in Stack DUT at Blackfoot Plant.
Process A	7101	0.106	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DUT at Blackfoot Plant
Process A	7102	0.106	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DUT at Blackfoot Plant
Process A	7019	0.083	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DHZ at Blackfoot Plant
Process A	7001	0.046	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DSO at Blackfoot Plant
Process A	7027	0.008	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DSK at Blackfoot Plant
Process A	7006	0.003	lb PM10/000 lbs production process output	Process and stack similarity to Stack DUY at Blackfoot Plant
Process B	5034	0.001	lb PM10/000 lbs production process output	Process and stack similarity to Stack CHV at Blackfoot Plant
Process B	5037	0.076	lb PM10/000 lbs production process output	Process and stack similarity to Stack CIR at Blackfoot Plant
Process B	4000	0.430	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant. 50 % of process emissions allocated to this stack.
Process B	228	0.274	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant. 25 % of process emissions allocated to this stack.
Process B	234	0.078	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant. 25 % of process emissions allocated to this stack.
Process B	311	0.195	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 25% of emission assigned to stack 311.
Process B	312	0.195	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 25% of emission assigned to stack 312.
Process B	410/411	0.391	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 50% of emission assigned to stack 410/411.
Process B	613/614	0.391	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; total process PM emission factor allocated in proportion to stack discharge air flows.

Table C-10. PM10 Emission Factors

Production Process	Stack Identification Code	Emission Factor	Units	Basis for Factor
Boilers	Kipper Boiler	0.271	lb PM10/000 lbs steam	Based on 50% firing of boiler with coal. From AP-42, Sec. 1.6 (7/01), 98 percent of total TSP emitted from wood waste boiler using multiclones and wet scrubber is PM10. This percentage applied to both coal and wood related emissions.
Plant	Woodpile	2.275	lb PM10/hr	Assumed to be 25% of PM factor
Boilers	Boiler 1	0.007	lb PM10/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf. All PM assumed to be PM10.
Boilers	Boiler 2	0.007	lb PM10/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled combustion and assuming 1020 BTU/scf. All PM assumed to be PM10.
Process A	7020	0.010	lb PM10/000 lbs unit process throughput	PM10 assumed to be 58.1% of TSP emissions. This fraction is the same as the fraction of solid PM that is PM10 measured in Stack DUT at Blackfoot Plant.
Process A	7101	0.106	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DUT at Blackfoot Plant
Process A	7102	0.106	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DUT at Blackfoot Plant
Process A	7019	0.083	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DHZ at Blackfoot Plant
Process A	7001	0.046	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DSO at Blackfoot Plant
Process A	7027	0.008	lb PM10/000 lbs unit process throughput	Process and stack similarity to Stack DSK at Blackfoot Plant
Process A	7006	0.003	lb PM10/000 lbs production process output	Process and stack similarity to Stack DUY at Blackfoot Plant
Process B	5034	0.001	lb PM10/000 lbs production process output	Process and stack similarity to Stack CHV at Blackfoot Plant
Process B	5037	0.076	lb PM10/000 lbs production process output	Process and stack similarity to Stack CIR at Blackfoot Plant
Process B	4000	0.430	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant. 50 % of process emissions allocated to this stack.
Process B	228	0.274	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant. 25 % of process emissions allocated to this stack.
Process B	234	0.078	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant. 25 % of process emissions allocated to this stack.
Process B	311	0.195	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 25% of emission assigned to stack 311.
Process B	312	0.195	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 25% of emission assigned to stack 312.
Process B	410/411	0.391	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; 50% of emission assigned to stack 410/411.
Process B	613/614	0.391	lb PM10/000 lbs production process output	Total process emission assumed to be the same as the sum of stacks HEB and HNL at Blackfoot Plant; total process PM emission factor allocated in proportion to stack discharge air flows.

Table C-11. PM10 Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	0.271	lb PM10/000 lbs steam	60	000 lbs steam/hr	16.25	525600	000 lbs steam/yr	71.2
Plant	Woodpile	2.275	lb PM10/hr	NA	-	2.275	8760	hrs/yr	10.0
Boilers	Boiler 1	0.007	lb PM10/MMBTU	52	MMBtu/hr	0.387	455520	MMBtu	1.7
Boilers	Boiler 2	0.007	lb PM10/MMBTU	35.0	MMBtu/hr	0.261	306600	MMBtu	1.1
Process A	7020	0.010	lb PM10/000 lbs unit process throughput	40.8	000 lbs throughput/hr	0.415	357408	000 lbs throughput/yr	1.8
Process A	7101	0.106	lb PM10/000 lbs unit process throughput	20.4	000 lbs throughput/hr	2.162	178704	000 lbs throughput/yr	9.5
Process A	7102	0.106	lb PM10/000 lbs unit process throughput	20.4	000 lbs throughput/hr	2.162	178704	000 lbs throughput/yr	9.5
Process A	7019	0.083	lb PM10/000 lbs unit process throughput	40.8	000 lbs throughput/hr	3.386	357408	000 lbs throughput/yr	14.8
Process A	7001	0.046	lb PM10/000 lbs unit process throughput	5.1	000 lbs throughput/hr	0.235	44676	000 lbs throughput/yr	1.0
Process A	7027	0.008	lb PM10/000 lbs unit process throughput	5.1	000 lbs throughput/hr	0.041	44676	000 lbs throughput/yr	0.2
Process A	7006	0.003	lb PM10/000 lbs production process output	40.8	000 lbs production process output	0.122	357408	000 lbs throughput/yr	0.5
Process B	5034	0.001	lb PM10/000 lbs production process output	17.0	000 lbs production process output	0.017	148920	000 lbs throughput/yr	0.1
Process B	5037	0.076	lb PM10/000 lbs production process output	17.0	000 lbs production process output	1.292	148920	000 lbs throughput/yr	5.7
Process B	4000	0.430	lb PM10/000 lbs production process output	4.0	000 lbs production process output	1.720	35040	000 lbs throughput/yr	7.5
Process B	228	0.274	lb PM10/000 lbs production process output	4.0	000 lbs production process output	1.096	35040	000 lbs throughput/yr	4.8
Process B	234	0.078	lb PM10/000 lbs production process output	4.0	000 lbs production process output	0.312	35040	000 lbs throughput/yr	1.4
Process B	311	0.195	lb PM10/000 lbs production process output	1.5	000 lbs production process output	0.293	13140	000 lbs throughput/yr	1.3
Process B	312	0.195	lb PM10/000 lbs production process output	1.5	000 lbs production process output	0.293	13140	000 lbs throughput/yr	1.3
Process B	410/411	0.391	lb PM10/000 lbs production process output	1.5	000 lbs production process output	0.587	13140	000 lbs throughput/yr	2.6
Process B	613/614	0.391	lb PM10/000 lbs production process output	2.8	000 lbs production process output	1.095	24528	000 lbs throughput/yr	4.8
Process B	615/616	0.305	lb PM10/000 lbs production process output	2.8	000 lbs production process output	0.854	24528	000 lbs throughput/yr	3.7
Process B	638	0.086	lb PM10/000 lbs production process output	2.8	000 lbs production process output	0.241	24528	000 lbs throughput/yr	1.1
Process B	707	0.000	lb PM10/000 lb of unit process throughput	30.4	000 lbs production process output	0.000	266304	000 lbs throughput/yr	0.0
Process B	725	0.002	lb PM10/000 lb of unit process throughput	30.4	000 lbs production process output	0.049	266304	000 lbs throughput/yr	0.2

Table C-11. PM10 Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Process B	8	0.002	lb PM10/000 lb of product transported	30.4	000 lb of product transported	0.049	266304	000 lbs throughput/yr	0.2
Process B	5001	0.008	lb PM10/000 lb of product transported	30.4	000 lb of product transported	0.243	266304	000 lbs throughput/yr	1.1
Process B	5000	0.002	lb PM10/000 lb of product transported	30.4	000 lb of product transported	0.049	266304	000 lbs throughput/yr	0.2
Process B	432	0.002	lb PM10/000 lb of product transported	30.4	000 lb of product transported	0.049	266304	000 lbs throughput/yr	0.2
Process B	322	0.008	lb PM10/000 lb of product transported	30.4	000 lb of product transported	0.243	266304	000 lbs throughput/yr	1.1
Process B	572	0.038	lb PM10/000 lb of product transported	5.0	000 lb of product transported	0.188	43680	000 lbs throughput/yr	0.8
Plant	Heaters	0.007	lb PM10/MMBTU	30.8	MMBtu/hr	0.229	134904	MMBtu	0.5
Plant	Plant Roads	3	lb PM10/hr	NA	lb/hr	3	8760	hrs/yr	15.0

Table C-12. VOC Emission Factors

Production Process	Stack Identification Code	Emission Factor	Emission Factor Units	Basis for Factor
Boilers	Kipper Boiler	0.049	lb VOC/000 lbs steam	From 1994 Source Emission Evaluation Report. Emission factor is for 100% firing with wood waste.
Plant	Woodpile	3.410	lb VOC/hr	From measurements made at wood chip piles by Axelsson et. al, 1992, *Measurements of terpene emissions from wood chip piles using Fourier transform infrared spectroscpoy,* Nordic Pulp and Paper Research Journal. Emission factor used is equal to 0.0095 lb/m2-day.
Boilers	Boiler 1	0.005	lb VOC/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled natural gas combustion, and assuming 1020 Btu/scf.
Boilers	Boiler 2	0.005	lb VOC/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled natural gas combustion, and assuming 1020 Btu/scf.
Process A	7101	0.005	lb VOC/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled natural gas combustion, and assuming 1020 Btu/scf.
Process A	7102	0.005	lb VOC/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled natural gas combustion, and assuming 1020 Btu/scf.
Process A	7019	0.005	lb VOC/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled natural gas combustion, and assuming 1020 Btu/scf.
Process B	228	0.005	lb VOC/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled natural gas combustion, and assuming 1020 Btu/scf.
Process B	234	0.005	lb VOC/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled natural gas combustion, and assuming 1020 Btu/scf.
Plant	Heaters	0.005	lb VOC/MMBTU	Based on AP-42, Table 1.4-2 (7/98), for uncontrolled natural gas combustion, and assuming 1020 Btu/scf.

Table C-13. VOC Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Hourly Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	0.0490	lb VOC/000 lbs steam	60	000 lbs steam/hr	2.939	525600	lbs steam	12.9
Plant	Woodpile	3.41	lb VOC/hr	-	-	3.410	8760	hrs/yr	14.9
Boilers	Boiler 1	0.0054	lb VOC/MMBTU	52	MMBTU/hr	0.280	455520	MMBtu	1.2
Boilers	Boiler 2	0.0054	lb VOC/MMBTU	35.0	MMBTU/hr	0.189	306600	MMBtu	0.8
Process A	7101	0.0054	lb VOC/MMBTU	6.50	MMBTU/hr	0.04	56940	MMBtu	0.2
Process A	7102	0.0054	lb VOC/MMBTU	6.50	MMBTU/hr	0.035	56940	MMBtu	0.2
Process A	7019	0.0054	lb VOC/MMBTU	6.60	MMBTU/hr	0.04	57816	MMBtu	0.2
Process B	228	0.0054	lb VOC/MMBTU	9.66	MMBTU/hr	0.05	84621.6	MMBtu	0.2
Process B	234	0.0054	lb VOC/MMBTU	6.44	MMBTU/hr	0.03	56414.4	MMBtu	0.2
Plant	Heaters	0.0054	lb VOC/MMBTU	30.80	MMBTU/hr	0.17	134904	MMBtu	0.4

Table C-14. Lead Emission Factors

Production Process	Stack Identification Code	Emission Factor	Emission Factor Units	Basis for Factor
Boilers	Kipper Boiler	7.20E-05	lb Pb/000 lbs steam	Based on 100% firing with wood waste. From AP-42, Sec. 1.6 (7/01) for wood waste combustion. Converted to steam rate assuming 7000 BTU/lb of fuel and 1500 Btu heat input/lb of steam
Boilers	Boiler 1	4.9E-07	lbs Pb/ MM Btu	Based on AP-42 emission factor of 0.0005 lbs Pb/MMscf of fuel combusted.
Boilers	Boiler 2	4.9E-07	lbs Pb/ MM Btu	Based on AP-42 emission factor of 0.0005 lbs Pb/MMscf of fuel combusted.
Process A	7101	4.9E-07	lbs Pb/ MM Btu	Based on AP-42 emission factor of 0.0005 lbs Pb/MMscf of fuel combusted.
Process A	7102	4.9E-07	lbs Pb/ MM Btu	Based on AP-42 emission factor of 0.0005 lbs Pb/MMscf of fuel combusted.
Process A	7019	4.9E-07	lbs Pb/ MM Btu	Based on AP-42 emission factor of 0.0005 lbs Pb/MMscf of fuel combusted.
Process B	228	4.9E-07	lbs Pb/ MM Btu	Based on AP-42 emission factor of 0.0005 lbs Pb/MMscf of fuel combusted.
Process B	234	4.9E-07	lbs Pb/ MM Btu	Based on AP-42 emission factor of 0.0005 lbs Pb/MMscf of fuel combusted.
Plant	Heaters	4.9E-07	lbs Pb/ MM Btu	Based on AP-42 emission factor of 0.0005 lbs Pb/MMscf of fuel combusted.

Table C-15. Lead Emissions

Production Process	Stack Identification Code	Emission Factor	Emission Factor Units	Operating Rate	Operating Rate Units	Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	7.20E-05	lb Pb/000 lbs steam	60	000 lbs steam/hr	4.32E-03	525600	lbs steam	1.89E-02
Boilers	Boiler 1	4.90E-07	lbs Pb/ MM Btu	52	MM Btu/hr	2.55E-05	455520	MMBtu	1.12E-04
Boilers	Boiler 2	4.90E-07	lbs Pb/ MM Btu	35	MM Btu/hr	1.72E-05	306600	MMBtu	7.51E-05
Process A	7101	4.90E-07	lbs Pb/ MM Btu	6.50	MM Btu/hr	3.19E-06	56940	MMBtu	1.40E-05
Process A	7102	4.90E-07	lbs Pb/ MM Btu	6.50	MM Btu/hr	3.19E-06	56940	MMBtu	1.40E-05
Process A	7019	4.90E-07	lbs Pb/ MM Btu	6.60	MM Btu/hr	3.24E-06	57816	MMBtu	1.42E-05
Process B	228	4.90E-07	lbs Pb/ MM Btu	9.66	MM Btu/hr	4.74E-06	84621.6	MMBtu	2.07E-05
Process B	234	4.90E-07	lbs Pb/ MM Btu	6.44	MM Btu/hr	3.16E-06	56414.4	MMBtu	1.38E-05
Plant	Heaters	4.90E-07	lbs Pb/ MM Btu	30.80	MM Btu/hr	1.51E-05	134904	MMBtu	3.31E-05

Table C-16. Cadmium Emission Factors

Production Process	Stack Identification Code	Emission Factor	Emission Factor Units	Basis for Factor
Boilers	Kipper Boiler	6.15E-06	lb Cd/000 lbs steam	Based on 100% firing with wood waste. Emission factor is from AP-42, Sec. 1.6 (7/01), Cd emission = 4.1E-6 lb Cd /MMBtu. Converted to steam rate assuming 1500 Btu heat input/lb of steam
Boilers	Boiler 1	1.08E-06	lbs Cd/ MM Btu	AP-42 emission factor of 0.0011 lbs Cd/MMscf of fuel combusted at 1020 Btu/scf.
Boilers	Boiler 2	1.08E-06	lbs Cd/ MM Btu	AP-42 emission factor of 0.0011 lbs Cd/MMscf of fuel combusted at 1020 Btu/scf.
Process A	7101	1.08E-06	lbs Cd/ MM Btu	AP-42 emission factor of 0.0011 lbs Cd/MMscf of fuel combusted at 1020 Btu/scf.
Process A	7102	1.08E-06	lbs Cd/ MM Btu	AP-42 emission factor of 0.0011 lbs Cd/MMscf of fuel combusted at 1020 Btu/scf.
Process A	7019	1.08E-06	lbs Cd/ MM Btu	AP-42 emission factor of 0.0011 lbs Cd/MMscf of fuel combusted at 1020 Btu/scf.
Process B	228	1.08E-06	lbs Cd/ MM Btu	AP-42 emission factor of 0.0011 lbs Cd/MMscf of fuel combusted at 1020 Btu/scf.
Process B	234	1.08E-06	lbs Cd/ MM Btu	AP-42 emission factor of 0.0011 lbs Cd/MMscf of fuel combusted at 1020 Btu/scf.
Plant	Heaters	1.08E-06	lbs Cd/ MM Btu	AP-42 emission factor of 0.0011 lbs Cd/MMscf of fuel combusted at 1020 Btu/scf.

Table C-17. Cadmium Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Hourly Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	6.15E-06	lb Cd/000 lbs steam	60	000 lbs steam/hr	3.69E-04	525600	lbs steam	1.62E-03
Boilers	Boiler 1	1.08E-06	lbs Cd/ MM Btu	52	MM Btu/hr	5.61E-05	455520	MMBtu	2.46E-04
Boilers	Boiler 2	1.08E-06	lbs Cd/ MM Btu	35	MM Btu/hr	3.77E-05	306600	MMBtu	1.65E-04
Process A	7101	1.08E-06	lbs Cd/ MM Btu	6.50	MM Btu/hr	7.01E-06	56940	MMBtu	3.07E-05
Process A	7102	1.08E-06	lbs Cd/ MM Btu	6.50	MM Btu/hr	7.01E-06	56940	MMBtu	3.07E-05
Process A	7019	1.08E-06	lbs Cd/ MM Btu	6.60	MM Btu/hr	7.12E-06	57816	MMBtu	3.12E-05
Process B	228	1.08E-06	lbs Cd/ MM Btu	9.66	MM Btu/hr	1.04E-05	84621.6	MMBtu	4.56E-05
Process B	234	1.08E-06	lbs Cd/ MM Btu	6.44	MM Btu/hr	6.95E-06	56414.4	MMBtu	3.04E-05
Plant	Heaters	1.08E-06	lbs Cd/ MM Btu	30.80	MM Btu/hr	3.32E-05	134904	MMBtu	7.27E-05

Table C-18. Nitrous Oxide Emission Factors

Production Process	Stack Identification Code	Emission Factor, Annual Emissions	Emission Factor Units	Basis for Factor
Boilers	Kipper Boiler	1.95E-02	lb N2O/000 lbs steam	Based on 100% firing with wood waste. From AP-42, Sec. 1.6 (7/01) for wood waste combustion. Converted to steam rate assuming 7000 BTU/lb of fuel and 1500 Btu heat input/lb of steam
Boilers	Boiler 1	2.16E-03	lbs N2O/ MM Btu	AP-42 emission factor of 2.2 lbs N2O/MMscf of fuel combusted at 1020 Btu/scf.
Boilers	Boiler 2	2.16E-03	lbs N2O/ MM Btu	AP-42 emission factor of 2.2 lbs N2O/MMscf of fuel combusted at 1020 Btu/scf.
Process A	7101	2.16E-03	lbs N2O/ MM Btu	AP-42 emission factor of 2.2 lbs N2O/MMscf of fuel combusted at 1020 Btu/scf.
Process A	7102	2.16E-03	lbs N2O/ MM Btu	AP-42 emission factor of 2.2 lbs N2O/MMscf of fuel combusted at 1020 Btu/scf.
Process A	7019	2.16E-03	lbs N2O/ MM Btu	AP-42 emission factor of 2.2 lbs N2O/MMscf of fuel combusted at 1020 Btu/scf.
Process B	228	2.16E-03	lbs N2O/ MM Btu	AP-42 emission factor of 2.2 lbs N2O/MMscf of fuel combusted at 1020 Btu/scf.
Process B	234	2.16E-03	lbs N2O/ MM Btu	AP-42 emission factor of 2.2 lbs N2O/MMscf of fuel combusted at 1020 Btu/scf.
Plant	Heaters	2.16E-03	lbs N2O/ MM Btu	AP-42 emission factor of 2.2 lbs N2O/MMscf of fuel combusted at 1020 Btu/scf.

Table C-19. Nitrous Oxide Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Hourly Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	1.95E-02	lb N2O/000 lbs steam	60	000 lbs steam/hr	1.17E+00	525600	lbs steam	5.1
Boilers	Boiler 1	2.16E-03	lbs N2O/ MM Btu	52	MM Btu/hr	1.12E-01	455520	MMBtu	0.5
Boilers	Boiler 2	2.16E-03	lbs N2O/ MM Btu	35	MM Btu/hr	7.55E-02	306600	MMBtu	0.3
Process A	7101	2.16E-03	lbs N2O/ MM Btu	6.50	MM Btu/hr	1.40E-02	56940	MMBtu	0.1
Process A	7102	2.16E-03	lbs N2O/ MM Btu	6.50	MM Btu/hr	1.40E-02	56940	MMBtu	0.1
Process A	7019	2.16E-03	lbs N2O/ MM Btu	6.60	MM Btu/hr	1.42E-02	57816	MMBtu	0.1
Process B	228	2.16E-03	lbs N2O/ MM Btu	9.66	MM Btu/hr	2.08E-02	84621.6	MMBtu	0.1
Process B	234	2.16E-03	lbs N2O/ MM Btu	6.44	MM Btu/hr	1.39E-02	56414.4	MMBtu	0.1
Plant	Heaters	2.16E-03	lbs N2O/ MM Btu	30.80	MM Btu/hr	6.64E-02	134904	MMBtu	0.1

Table C-20. Beryllium Emission Factors

Production Process	Stack Identification Code	Emission Factor, Annual Emissions	Emission Factor Units	Basis for Factor
Boilers	Kipper Boiler	1.65E-06	lbs Be/000 lbs steam	Based on 100% firing with wood waste. From AP-42, Sec. 1.6 (7/01) for wood waste combustion. Converted to steam rate assuming 7000 BTU/lb of fuel and 1500 Btu heat input/lb of steam
Boilers	Boiler 1	1.18E-08	lbs Be/ MM Btu	Based on 0.0000118 lbs Be/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Boilers	Boiler 2	1.18E-08	lbs Be/ MM Btu	Based on 0.0000118 lbs Be/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process A	7101	1.18E-08	lbs Be/ MM Btu	Based on 0.0000118 lbs Be/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process A	7102	1.18E-08	lbs Be/ MM Btu	Based on 0.0000118 lbs Be/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process A	7019	1.18E-08	lbs Be/ MM Btu	Based on 0.0000118 lbs Be/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process B	228	1.18E-08	lbs Be/ MM Btu	Based on 0.0000118 lbs Be/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process B	234	1.18E-08	lbs Be/ MM Btu	Based on 0.0000118 lbs Be/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Plant	Heaters	1.18E-08	lbs Be/ MM Btu	Based on 0.0000118 lbs Be/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).

Table C-21. Beryllium Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Hourly Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	1.65E-06	lbs Be/000 lbs steam	60	000 lbs steam/hr	9.90E-05	525600	lbs steam	4.33E-04
Boilers	Boiler 1	1.18E-08	lbs Be/ MM Btu	52	MM Btu/hr	6.12E-07	455520	MMBtu	2.68E-06
Boilers	Boiler 2	1.18E-08	lbs Be/ MM Btu	35	MM Btu/hr	4.12E-07	306600	MMBtu	1.80E-06
Process A	7101	1.18E-08	lbs Be/ MM Btu	6.50	MM Btu/hr	7.65E-08	56940	MMBtu	3.35E-07
Process A	7102	1.18E-08	lbs Be/ MM Btu	6.50	MM Btu/hr	7.65E-08	56940	MMBtu	3.35E-07
Process A	7019	1.18E-08	lbs Be/ MM Btu	6.60	MM Btu/hr	7.76E-08	57816	MMBtu	3.40E-07
Process B	228	1.18E-08	lbs Be/ MM Btu	9.66	MM Btu/hr	1.14E-07	84621.6	MMBtu	4.98E-07
Process B	234	1.18E-08	lbs Be/ MM Btu	6.44	MM Btu/hr	7.58E-08	56414.4	MMBtu	3.32E-07
Plant	Heaters	1.18E-08	lbs Be/ MM Btu	30.80	MM Btu/hr	3.62E-07	134904	MMBtu	7.94E-07

Table C-22. Mercury Emission Factors

Production Process	Stack Identification Code	Emission Factor, Annual Emissions	Emission Factor Units	Basis for Factor
Boilers	Kipper Boiler	5.25E-06	lbs Hg/000 lbs steam	Based on 100% firing with wood waste. From AP-42, Sec. 1.6 (7/01) for wood waste combustion. Converted to steam rate assuming 7000 BTU/lb of fuel and 1500 Btu heat input/lb of steam
Boilers	Boiler 1	2.55E-07	lbs Hg/ MM Btu	Based on 0.000255 lbs Hg/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Boilers	Boiler 2	2.55E-07	lbs Hg/ MM Btu	Based on 0.000255 lbs Hg/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process A	7101	2.55E-07	lbs Hg/ MM Btu	Based on 0.000255 lbs Hg/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process A	7102	2.55E-07	lbs Hg/ MM Btu	Based on 0.000255 lbs Hg/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process A	7019	2.55E-07	lbs Hg/ MM Btu	Based on 0.000255 lbs Hg/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process B	228	2.55E-07	lbs Hg/ MM Btu	Based on 0.000255 lbs Hg/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Process B	234	2.55E-07	lbs Hg/ MM Btu	Based on 0.000255 lbs Hg/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).
Plant	Heaters	2.55E-07	lbs Hg/ MM Btu	Based on 0.000255 lbs Hg/10^12 Btu (AP-42 emission factor for natural gas combustion at 1020 Btu/scf).

Table C-23. Mercury Emissions

Production Process	Stack Identification Code	Emission Factor	Units	Hourly Operating Factor	Hourly Operating Units	Hourly Emission Rate, lb/hr	Annual Operating Factor	Annual Operating Units	Annual Emissions, tpy
Boilers	Kipper Boiler	5.25E-06	lbs Hg/000 lbs steam	60	000 lbs steam/hr	3.15E-04	525600	lbs steam	1.38E-03
Boilers	Boiler 1	2.55E-07	lbs Hg/ MM Btu	52	MM Btu/hr	1.33E-05	455520	MMBtu	5.81E-05
Boilers	Boiler 2	2.55E-07	lbs Hg/ MM Btu	35	MM Btu/hr	8.92E-06	306600	MMBtu	3.91E-05
Process A	7101	2.55E-07	lbs Hg/ MM Btu	6.50	MM Btu/hr	1.66E-06	56940	MMBtu	7.26E-06
Process A	7102	2.55E-07	lbs Hg/ MM Btu	6.50	MM Btu/hr	1.66E-06	56940	MMBtu	7.26E-06
Process A	7019	2.55E-07	lbs Hg/ MM Btu	6.60	MM Btu/hr	1.68E-06	57816	MMBtu	7.37E-06
Process B	228	2.55E-07	lbs Hg/ MM Btu	9.66	MM Btu/hr	2.46E-06	84621.6	MMBtu	1.08E-05
Process B	234	2.55E-07	lbs Hg/ MM Btu	6.44	MM Btu/hr	1.64E-06	56414.4	MMBtu	7.19E-06
Plant	Heaters	2.55E-07	lbs Hg/ MM Btu	30.80	MM Btu/hr	7.85E-06	134904	MMBtu	1.72E-05

APPENDIX D

EMISSION FACTORS FOR COMBUSTION RELATED HAZARDOUS AIR POLLUTANTS

Hazardous Air Pollutant Emission Factors for Natural Gas - External Combustion. Based on 1020 Btu/scf

All emission factors from AP-42, Chapter 1.4

Pollutant		Emission Factor	
		lb/MMScf	lb/MMBtu
Lead		5.00E-04	4.90E-07
POM (sum of POM consituuents listed below)		8.82E-05	8.65E-08
2-Methylnaphthalene	2.40E-05		
3-Methylchloranthrene	1.80E-06		
7,12-Dimethylbenz(a)anthracene	1.60E-05		
Acenaphthene	1.80E-06		
Acenaphthylene	1.80E-06		
Anthracene	2.40E-06		
Benz(a)anthracene	1.80E-06		
Benzo(a)pyrene	1.20E-06		
Benzo(b)fluoranthene	1.80E-06		
Benzo(g,h,i)perylene	1.20E-06		
Benzo(k)fluoranthene	1.80E-06		
Chrysene	1.80E-06		
Dibenzo(a,h)anthracene	1.20E-06		
Fluoranthene	3.00E-06		
Fluorene	2.80E-06		
Indeno(1,2,3-cd)pyrene	1.80E-06		
Phenanathrene	1.70E-05		
Pyrene	5.00E-06		
Benzene		2.10E-03	2.06E-06
Dichlorobenzene		1.20E-03	1.18E-06
Formaldehyde		7.50E-02	7.35E-05
Hexane		1.80E+00	1.76E-03
Naphthalene		6.10E-04	5.98E-07
Toluene		3.40E-03	3.33E-06
Arsenic		2.00E-04	1.96E-07
Beryllium		1.20E-05	1.18E-08
Cadmium		1.10E-03	1.08E-06
Chromium		1.40E-03	1.37E-06
Cobalt		8.40E-05	8.24E-08
Manganese		3.80E-04	3.73E-07
Mercury		2.60E-04	2.55E-07
Nickel		2.10E-03	2.06E-06
Selenium		2.40E-05	2.35E-08
	Total HAP Emission Factor:		1.85E-03
	Largest Emisson Factor (Hexane):		1.76E-03

Hazardous Air Pollutant Emission Factors for Wood Waste Combustion. Based on 1500 Btu/lb of Steam

All emission factors from AP-42, Chapter 1.6

Pollutant	Emission Factor	
	lb/MMBtu	lb/000 lbs steam
Acetaldehyde	8.30E-04	1.25E-03
Acetophenone	3.20E-09	4.80E-09
Acrolein	4.00E-03	6.00E-03
Benzene	4.20E-03	6.30E-03
bis(2-Ethylhexyl)phthalate	4.70E-08	7.05E-08
Bromomethane	1.50E-05	2.25E-05
2-Butanone (MEK)	5.40E-06	8.10E-06
Carbon tetrachloride	4.50E-05	6.75E-05
Chlorine	7.90E-04	1.19E-03
Chlorobenzene	3.30E-05	4.95E-05
Chloroform	2.80E-05	4.20E-05
Chloromethane	2.30E-05	3.45E-05
1,2-Dichloroethane	2.90E-05	4.35E-05
Dichloromethane	2.90E-04	4.35E-04
1,2-Dichloropropane	3.30E-05	4.95E-05
2,4-Dinitrophenol	1.80E-07	2.70E-07
Ethylbenzene	3.10E-05	4.65E-05
Formaldehyde	4.40E-03	6.60E-03
Heptachlorodibenzo-p-furans	2.40E-10	3.60E-10
Hexachlorodibenzo-p-furans	2.80E-10	4.20E-10
Hydrogen chloride	1.90E-02	2.85E-02
Indeno(1,2,3,c,d)pyrene	8.70E-08	1.31E-07
Naphthalene	9.70E-05	1.46E-04
4-Nitrophenol	1.10E-07	1.65E-07
Octachlorodibenzo-p-furans	8.80E-11	1.32E-10
Pentachlorodibenzo-p-furans	4.20E-10	6.30E-10
Pentachlorophenol	5.10E-08	7.65E-08
Phenol	5.10E-05	7.65E-05
Styrene	1.90E-03	2.85E-03
2,3,7,8-Tetrachlorodibenzo-p-dioxins	8.60E-12	1.29E-11
2,3,7,8-Tetrachlorodibenzo-p-furans	9.00E-11	1.35E-10
Tetrachlorodibenzo-p-furans	7.50E-10	1.13E-09
Tetrachloroethene	3.80E-05	5.70E-05
Toluene	9.20E-04	1.38E-03
1,1,1-Trichloroethane	3.10E-05	4.65E-05
Trichloroethene	3.00E-05	4.50E-05
2,4,6-Trichlorophenol	2.20E-08	3.30E-08
Vinyl Chloride	1.80E-05	2.70E-05
o-Xylene	2.50E-05	3.75E-05
POM (sum of POM consituuents listed below)	2.77E-05	4.16E-05
Acenaphthene	9.10E-07	
Acenaphthylene	5.00E-06	
Anthracene	3.00E-06	
Benzo(a)anthracene	6.50E-08	
Benzo(a)pyrene	2.60E-06	
Benzo(b)fluoranthene	1.00E-07	
Benzo(e)pyrene	2.60E-09	
Benzo(g,h,i)perylene	9.30E-08	
Benzo(j,k)fluoranthene	1.60E-07	
Benzo(k)fluoranthene	3.60E-08	
Chrysene	3.80E-08	
Dibenzo(a,h)anthracene	9.10E-09	
Fluoranthene	1.60E-06	
Fluorene	3.40E-06	
Perylene	5.20E-10	

Hazardous Air Pollutant Emission Factors for Wood Waste Combustion. Based on 1500 Btu/lb of Steam

All emission factors from AP-42, Chapter 1.6

Pollutant		Emission Factor	
		lb/MMBtu	lb/000 lbs steam
Phenanthrene	7.00E-06		
Pyrene	3.70E-06		
Antimony		7.90E-06	1.19E-05
Arsenic		2.20E-05	3.30E-05
Beryllium		1.10E-06	1.65E-06
Cadmium		4.10E-06	6.15E-06
Chromium, total		2.10E-05	3.15E-05
Chromium, hexavalent		3.50E-06	5.25E-06
Cobalt		6.50E-06	9.75E-06
Lead		4.80E-05	7.20E-05
Manganese		1.60E-03	2.40E-03
Mercury		3.50E-06	5.25E-06
Nickel		3.30E-05	4.95E-05
Selenium		2.80E-06	4.20E-06
Total HAP Emission Factor:		**3.86E-02**	**5.80E-02**
Largest Emisson Factor (Hydrogen chloride):		**1.90E-02**	**2.85E-02**

Hazardous Air Pollutant Emission Factors for Subbituminous Coal Combustion. Based on 9500 Btu/lb of Coal and 1500 Btu/lb of Steam

All emission factors from AP-42, Chapter 1.1

Pollutant		Emission Factor lb/ton	Emission Factor lb/MMBtu	Reference Table from AP-42, Chapter 1.1
2,3,7,8-TCDD		1.43E-11	7.53E-13	Tbl 1.1-12
Total PCDF		1.09E-09	5.74E-11	Tbl 1.1-12
POM (sum of POM consituuents listed		2.08E-05	1.09E-06	Tbl 1.1-13
5-Methyl chrysene	2.20E-08			
Acenaphthene	5.10E-07			
Acenaphthylene	2.50E-07			
Anthracene	2.10E-07			
Benzo(a)anthracene	8.00E-08			
Benzo(a)pyrene	3.80E-08			
Benzo(b,j,k)fluoranthe	1.10E-07			
Benzo(g,h,i)perylene	2.70E-08			
Biphenyl	1.70E-06			
Chrysene	1.00E-07			
Fluoranthene	7.10E-07			
Fluorene	9.10E-07			
Indeno(1,2,3-cd)pyren	6.10E-08			
Naphthalene	1.30E-05			
Phenanthrene	2.70E-06			
Pyrene	3.30E-07			
Acetaldehyde		5.70E-04	3.00E-05	Tbl 1.1-14
Acetophenone		1.50E-05	7.89E-07	Tbl 1.1-14
Acrolein		2.90E-04	1.53E-05	Tbl 1.1-14
Benzene		1.30E-03	6.84E-05	Tbl 1.1-14
Benzyl chloride		7.00E-04	3.68E-05	Tbl 1.1-14
Bis(2-ethylhexyl)phthalate (DEHP)		7.30E-05	3.84E-06	Tbl 1.1-14
Bromoform		3.90E-05	2.05E-06	Tbl 1.1-14
Carbon disulfide		1.30E-04	6.84E-06	Tbl 1.1-14
2-Chloroacetophenone		7.00E-06	3.68E-07	Tbl 1.1-14
Chlorobenzene		2.20E-05	1.16E-06	Tbl 1.1-14
Chloroform		5.90E-05	3.11E-06	Tbl 1.1-14
Cumene		5.30E-06	2.79E-07	Tbl 1.1-14
Cyanide		2.50E-03	1.32E-04	Tbl 1.1-14
2,4-Dinitrotoluene		2.80E-07	1.47E-08	Tbl 1.1-14
Dimethyl sulfate		4.80E-05	2.53E-06	Tbl 1.1-14
Ethyl benzene		9.40E-05	4.95E-06	Tbl 1.1-14
Ethyl chloride		4.20E-05	2.21E-06	Tbl 1.1-14
Ethylene dichloride		4.00E-05	2.11E-06	Tbl 1.1-14
Ethylene dibromide		1.20E-06	6.32E-08	Tbl 1.1-14
Formaldehyde		2.40E-04	1.26E-05	Tbl 1.1-14
Hexane		6.70E-05	3.53E-06	Tbl 1.1-14
Isophorone		5.80E-04	3.05E-05	Tbl 1.1-14
Methyl bromide		1.60E-04	8.42E-06	Tbl 1.1-14
Methyl chloride		5.30E-04	2.79E-05	Tbl 1.1-14
Methyl ethyl ketone		3.90E-04	2.05E-05	Tbl 1.1-14
Methyl hydrazine		1.70E-04	8.95E-06	Tbl 1.1-14
Methyl methacrylate		2.00E-05	1.05E-06	Tbl 1.1-14
Methyl tert butyl ether		3.50E-05	1.84E-06	Tbl 1.1-14
Methylene chloride		2.90E-04	1.53E-05	Tbl 1.1-14
Phenol		1.60E-05	8.42E-07	Tbl 1.1-14

Hazardous Air Pollutant Emission Factors for Subbituminous Coal Combustion. Based on 9500 Btu/lb of Coal and 1500 Btu/lb of Steam

All emission factors from AP-42, Chapter 1.1

Pollutant	Emission Factor		Reference Table from AP-42, Chapter 1.1
	lb/ton	lb/MMBtu	
Propionaldehyde	3.80E-04	2.00E-05	Tbl 1.1-14
Tetrachloroethylene	4.30E-05	2.26E-06	Tbl 1.1-14
Toluene	2.40E-04	1.26E-05	Tbl 1.1-14
1,1,1-Trichloroethane	2.00E-05	1.05E-06	Tbl 1.1-14
Styrene	2.50E-05	1.32E-06	Tbl 1.1-14
Xylenes	3.70E-05	1.95E-06	Tbl 1.1-14
Vinyl acetate	7.60E-06	4.00E-07	Tbl 1.1-14
Hydrogen chloride	1.20E+00	6.32E-02	Tbl 1.1-15
Hydrogen fluoride	1.50E-01	7.89E-03	Tbl 1.1-15
Antimony	1.80E-05	9.47E-07	Tbl 1.1-18
Arsenic	4.10E-04	2.16E-05	Tbl 1.1-18
Beryllium	2.10E-05	1.11E-06	Tbl 1.1-18
Cadmium	5.10E-05	2.68E-06	Tbl 1.1-18
Chromium	2.60E-04	1.37E-05	Tbl 1.1-18
Cobalt	1.00E-04	5.26E-06	Tbl 1.1-18
Lead	4.20E-04	2.21E-05	Tbl 1.1-18
Manganese	4.90E-04	2.58E-05	Tbl 1.1-18
Mercury	8.30E-05	4.37E-06	Tbl 1.1-18
Nickel	2.80E-04	1.47E-05	Tbl 1.1-18
Selenium	1.30E-03	6.84E-05	Tbl 1.1-18
Total HAP Emission Factor:	**1.36E+00**	**7.17E-02**	
nisson Factor (Hydrogen chloride):	**1.20E+00**	**6.32E-02**	

APPENDIX E

AIR DISPERSION MODELING PROTOCOL

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706-1255 • (208) 373-0502

Dirk Kempthorne, Governor
C. Stephen Allred, Director

April 5, 2004

Certified Mail No. 7099 3220 0009 1975 4441

Bruce Wright, Senior Environmental Manager
Basic American Foods, Inc.
415 W. Collins Road
Blackfoot, ID 83221

Re: Basic American Foods, Blackfoot, Shelley and Rexburg, ID
Modeling Document Reviews

Dear Mr. Wright:

The Department of Environmental Quality (DEQ) received three air dispersion modeling documents from Coal Creek Environmental Consultants, LLC on behalf of Basic American Foods (BAF) as given below:

- Revised Air Quality Modeling Protocol for Air Quality Compliance Plan, BAF Rexburg Plant, January 5, 2004
- Revised Air Quality Modeling Protocol for Air Quality Compliance Plan, BAF Blackfoot and Shelley Plants, February 2, 2004
- Proposed Air Dispersion Modeling Scenarios for NAAQS Compliance Demonstration Plan for the BAF Rexburg Plant, March 2, 2004

DEQ has reviewed these documents to ensure compliance with DEQ and EPA's requirements. The revisions to the original modeling methodology and assumptions discussed in the revised documents are appropriate for the air dispersion modeling analysis for these projects.

DEQ's modeling staff considers the submitted revised dispersion modeling protocols to be complete and approved. It should be noted, however, that the approval of these modeling protocols is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/air_permits.htm, for further guidance.

To ensure a complete and timely review of the final analyses, our modeling staff requests that electronic copies of all modeling input files (including Building Profile Input Program (BPIP) and meteorological data files) and output files are submitted with an analysis report. In addition, a scaled facility plot plan, with building heights noted, should be submitted with the analysis report. If you have any further questions, please contact me at (208) 373-0212.

Sincerely,

Mike Simon
Permit Program Coordinator
Air Quality Division

MS/sd

COAL CREEK ENVIRONMENTAL ASSOCIATES, LLC

4621 118th Ave SE
Bellevue, WA 98006

www.coalcreekenv.com

Phone: 425-373-4888
Fax: 425-373-4888
Cell: 425-922-0444

January 5, 2004

Mr. Mike K. Simon
Air Quality Division
Idaho Department of Environmental Quality
1410 North Hilton
Boise, ID 83706-1255

SUBJECT: Revised Air Quality Modeling Protocol for Air Quality Compliance Plan, Basic American Foods Rexburg Plants

Dear Mr. Simon:

Enclosed is a copy of a Revised Air Quality Modeling Protocol for the Air Quality Compliance Plan for the Basic American Foods (BAF) Rexburg, ID plant. This Protocol is submitted as item 1 of BAF's November 24, 2003 work plan for the Rexburg Plant.

Please contact me if you have questions or need additional information.

Yours truly,

Stephen J. Nelson, PE
Manager
Coal Creek Environmental Associates, LLC

Attachment

Cc: BAF – Bruce Wright

REVISED AIR QUALITY MODELING PROTOCOL FOR AIR QUALITY COMPLIANCE PLAN

BASIC AMERICAN FOODS REXBURG PLANT

As part of the processing of the Tier II Permit application for the Basic American Foods (BAF) Rexburg Plant, BAF is required to submit a *NAAQS Compliance Demonstration Plan* presenting details of proposed stack changes and other changes in facility operations that will enable the plant to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) for PM-10.

Air quality dispersion modeling of plant emissions with the proposed changes is part of the program to demonstrate compliance with the NAAQS. This protocol describes proposed procedures for the air quality dispersion modeling that will be conducted in support of the *NAAQS Compliance Demonstration Plan*.

MODEL DESCRIPTION/JUSTIFICATION

The Dispersion modeling will extend the modeling conducted in support of BAF's Tier II Permit. This modeling effort was described and documented in BAF's previous submittal, *Air Quality Impact Analysis Report for Tier II Air Operating Permit Applications, Basic American Foods – Blackfoot, Shelley, & Rexburg, ID Plant, May 2003* (prepared by Coal Creek Environmental Associates, LLC). Attachment A is the *Revised Air Quality Modeling Protocol*, dated 4 February 2003) that was used for that modeling.

This modeling will follow the February 2003 protocol in Attachment A, with the following changes:

1. Version of ISC Prime model to be used.

   The EPA version of the ISC-Prime model does not support the use of area-poly sources. Because area-poly sources are used to represent site roads and the wood fuel pile, the modeling will be run using *ISC3PBEE*, the BEE-Line Software version of ISC-Prime. ISC3PBEE is a version of the ISC-Prime model, adapted by BEE-Line Software to process area-poly sources.

2. Exclusion of fugitive dust emissions from roads from dispersion model.

   Per the discussions in our meeting on October 2, 2003, we propose to exclude road fugitive dust emissions from the air quality impact analysis. The meteorologic conditions associated with maximum impact from road fugitive dust emissions are markedly different from those associated with maximum impact from stack emissions. Accordingly, these are distinct emissions conditions that can be separated. The meteorologic data differences between days associated with maximum fugitive emissions from road dust and days associated with maximum emissions from other sources are discussed in the next section.

   Impacts of fugitive dust emissions from roads will be addressed by implementing Best Management Practices for road fugitive dust control.

METEOROLOGIC DATA DIFFERENCES INVOLVING FUGITIVE EMISSIONS OF ROAD DUST

The Full Impact Report for the Rexburg Plant included modeling under different scenarios, based on whether the Kipper Boiler was firing only wood or a wood-coal mixture. The same modeling runs also identified impacts from all roads, aggregated into a single group of sources. The dates and predicted impacts from these modeling runs for 24-hour PM-10 averaging periods (using the five-year concatenated meteorologic data set) are summarized below.

Identification of Days with Maximum Predicted PM-10 Air Quality Impacts

Source Group Identification	Highest High		2nd Highest High		6th Highest High	
	Date	Predicted Impact, ug/m^3	Date	Predicted Impact, ug/m^3	Date	Predicted Impact, ug/m^3
All Sources – Coal Firing Option	9/27/88	109.50	6/14/88	97.13	7/16/88	85.24
All Sources – Without Coal Firing	9/27/88	102.06	5/7/87	90.76	7/22/88	79.85
Roads (all roads aggregated)	1/26/89	33.91	1/31/91	29.75	12/12/88	25.49

The hourly meteorologic data sets associated with each of the data fields for the days identified above were extracted from the meteorologic data set. Average values for each of the meteorologic parameters were then calculated for 24-hour periods. Results of these calculations are summarized below. Attachment B contains the complete data tables for those days.

Meteorologic Data Averages for Days with Maximum Predicted PM-10 Impacts from Non-Road Sources

Date	Vector	Wind Speed, m/s	Temp.	Stability	Rural Mixing Height	Urban Mixing Height
9/27/88	61	7.67	283.6	5	1323.2	877.3
6/14/88	176	3.00	292.2	4	2751.3	1899.6
7/16/88	54	5.74	298.0	4	1776.6	1488.9

Meteorologic Data Averages for Days with Maximum Predicted PM-10 Impacts from Non-Road Sources

Date	Vector	Wind Speed, m/s	Temp.	Stability	Rural Mixing Height	Urban Mixing Height
5/7/87	210	2.21	292.3	4	3468.4	2199.8
7/22/88	71	5.25	299.7	4	1825.9	1218.4
Grand Average	114	4.78	293.2	4	2229.1	1536.8

Meteorologic Data Averages for Days with Maximum Predicted PM-10 Impacts from Road Fugitive Dust

Date	Vector	Wind Speed, m/s	Temp.	Stability	Rural Mixing Height	Urban Mixing Height
1/26/89	213	1.97	257.3	4.9	455.7	327.2
1/31/91	240	2.14	264.3	4.6	395.8	253.9
12/12/88	228	2.38	270.4	3.9	282.8	288.1
Grand Average	227	2.16	264.0	4.5	378.1	289.7

As indicated, the days on which there are maximum predicted PM-10 impacts from road fugitive dust are quite distinct from days on which non-road source PM-10 impacts are greatest. Days with maximum predicted road fugitive dust impacts show the following characteristics:

- Drastically lower mixing heights
- Calmer wind conditions
- Prevailing wind consistently from the southwest

In addition, the maximum predicted road dust emissions occur during winter months, when freezing weather, ice, and snow conditions lead to reduced fugitive dust generation.

These meteorologic differences establish that factors causing high road dust emissions do not occur contemporaneous with conditions leading to maximum reported emissions from points sources.

ATTACHMENT A

FEBRUARY 2003 AIR QUALITY MODELING PROTOCOL – BASIC AMERICAN FOODS SHELLEY, BLACKFOOT, AND REXBURG PLANT

REVISED AIR QUALITY MODELING PROTOCOL
BASIC AMERICAN FOODS
SHELLEY, BLACKFOOT AND REXBURG PLANTS

This protocol describes proposed procedures for conducting air quality dispersion modeling for the Basic American Foods (BAF) plants in Shelley, Blackfoot, and Rexburg, ID. This protocol follows the organization of Section 5.12 of the *State of Idaho Air Quality Modeling Guideline* (Doc. ID AQ-011(rev. 1 12/31/02)) (the *Guideline*).

PURPOSE

The purpose of the air quality modeling analysis is to provide a Full Impact Analysis of plant emissions in support of Tier II permit applications for each of these plants.

MODEL DESCRIPTION/JUSTIFICATION

Dispersion modeling will be conducted with ISC-Prime, using BPIP-Prime to evaluate building cavity and downwash effects. Modeling will be conducted using BEEST for Windows, Version 8.93 (released January 2003). BEEST for Windows is a modeling manager for ISCST3, ISC-Prime and AerMod modeling and is distributed by BEE-Line Software[1].

Although EPA has not officially adopted ISC-Prime for source dispersion modeling, EPA does recognize ISC-Prime as a legitimate dispersion model for use with industrial sources. When used with BPIP-Prime, ISC-Prime is an appropriate model for sites with short stacks and complex rooflines typical of BAF plants.

EMISSION AND SOURCE DATA

Emission rates and stack parameters will be the same as presented in the Tier II permit application that will accompany the modeling analysis. All impacts for averaging periods of one day or less will be based on maximum hourly estimated emissions. Annual averages will be based on maximum annual emission rates divided by maximum permitted hours of operation (or 8760 hours if there no enforceable limits on hours of operation). At this time, we do not propose to exclude any sources of emissions from the modeling analysis other than the "trivial" activities identified in Table 8 of the *Guideline*.

Because the rooflines at each plant have multiple discrete high points, the buildings cannot be appropriately represented as tiered structures. Accordingly, changes in roof height will be depicted using individual buildings with coordinates set to create common walls. Sloping and pitched roofs will be modeled as flat roofs, with the roof height equal to highest roof elevation. Miscellaneous small roof structures (such as air make-up units, and access doorways) will be ignored.

[1] PO Box 7348, Asheville, NC 28802. www.beeline-software.com.

Stacks that have a rain cap or that are released horizontally or downward will be treated as follows:

- They will be modeled as point sources, using the actual height of release, stack gas temperature, and UTM coordinates.
- The stack velocity will be set equal to 0.001 m/s to prevent the model from accounting for momentum plume rise.
- If the stack is a horizontal stack or discharges downward, the stack diameter will be set to 0.001 meters to eliminate stack downwash effects. (For vertical stacks with rain caps, the actual stack diameter will be used.)

Fugitive emissions from buildings will be modeled as a surface based single volume source with a release height equal to one-half the maximum height of the composite building associated with the emission.

Fugitive road emissions will be modeled as a ground-level areapoly source aligned with principal site roads.

Ambient air boundaries will be based on plant fenceline where the plant perimeter is fenced or otherwise is effectively controlled as described in Section 5.5 of the *Guideline.*

All buildings and sources will be referenced to UTM coordinates (NAD27).

RECEPTOR NETWORK

A fenceline receptor grid with 25 meter spacing will be placed along the plant ambient air quality boundaries. This fenceline receptor grid will extend for a distance of 100 meters from these boundaries. A general receptor grid with 100 meter spacing will be placed outside the fenceline grid. This general grid will extend 1000 meters beyond the fenceline.

Based on model results, additional receptors may be added to better define impacts.

ELEVATION DATA

Elevation data for receptors and bases of buildings and sources will be obtained from USGS 7.5' digital raster graphics maps georeferenced to UTM coordinates. Presentation graphics will be superimposed on 7.5' minute USGS terrain maps.

METEOROLOGIC DATA

The meteorologic data set will use 1987 to 1991 surface data from Pocatello and 1987 to 1991 mixing height data from Boise, available from the US EPA SCRAM website.

LAND USE CLASSIFICATION

Land use around all three plants is rural.

BACKGROUND CONCENTRATION

We expect that DEQ will provide the background data to be used in these analyses.

EVALUATION OF COMPLIANCE WITH STANDARDS

Background concentrations will be added to modeled concentrations to assess compliance with standards. Compliance with the PM-10 standard will be based on the "highest 6th-high" method. This method consists of calculating the highest 6th-high 24-hour average concentration for each receptor for a five-year period and calculating the highest five-year average for the "annual" value ("highest" means the receptor with the highest value, e.g. highest 6th high or highest 5-year average). Compliance with other 24-hours standards allowing one exceedance per year will be done by examining each year of data separately (i.e., for each year modeled, no more than one exceedance will be allowed at any receptor).

Tables summarizing the air quality model output will provided as shown in Appendix E of the *Draft Guideline.*

ELECTRONIC COPIES OF THE MODELING FILES

Electronic copies of modeling input/output files will be provided on CD. The files will include:

- BPIP input file
- ISC-Prime model input file
- ISC-Prime model output file
- Hourly meteorologic data files (in ASCII format)

ATTACHMENT B

COMPLETE METEROLOGIC DATA FOR DAYS WITH MAXIMUM ESTIMATED PM-10 IMPACTS

TABLE B-1
METEOROLOGIC DATA FOR DAYS WITH MAXIMUM PREDICTED IMPACTS FROM NON-ROAD SOURCES

rank	Yr	Mo	Da	Hr	Vector	Wind Speed, m/s	Temp	Stability	Rural Mixing Height	Urban Mixing Height
1st high	88	9	27	1	4	2.06	282.6	6	1873.5	376.0
1st high	88	9	27	2	68	2.06	280.4	6	1841.3	376.0
1st high	88	9	27	3	62	1.54	279.3	7	1809.1	376.0
1st high	88	9	27	4	21	3.60	279.8	6	1776.9	376.0
1st high	88	9	27	5	93	1.54	279.8	7	1744.7	376.0
1st high	88	9	27	6	67	4.12	278.7	6	1712.5	376.0
1st high	88	9	27	7	55	3.60	278.2	5	106.6	455.0
1st high	88	9	27	8	62	11.32	285.4	4	299.2	597.9
1st high	88	9	27	9	76	9.26	284.8	4	491.8	740.7
1st high	88	9	27	10	74	10.80	284.8	4	684.5	883.6
1st high	88	9	27	11	78	10.29	286.5	4	877.1	1026.4
1st high	88	9	27	12	66	12.35	285.4	4	1069.7	1169.3
1st high	88	9	27	13	67	13.38	285.4	4	1262.4	1312.1
1st high	88	9	27	14	74	12.35	287.0	4	1455.0	1455.0
1st high	88	9	27	15	69	15.43	288.7	4	1455.0	1455.0
1st high	88	9	27	16	66	13.38	289.3	4	1455.0	1455.0
1st high	88	9	27	17	68	11.32	288.7	4	1455.0	1455.0
1st high	88	9	27	18	69	9.77	287.0	4	1455.0	1455.0
1st high	88	9	27	19	56	9.26	285.9	4	1462.9	1462.9
1st high	88	9	27	20	69	5.66	284.8	4	1473.2	1473.2
1st high	88	9	27	21	71	6.69	283.7	4	1483.6	1483.6
1st high	88	9	27	22	58	4.63	281.5	5	1494.0	547.8
1st high	88	9	27	23	46	5.14	280.9	5	1504.4	306.4
1st high	88	9	27	24	33	4.63	278.7	5	1514.7	65.0
1st high Average					**61**	**7.67**	**283.6**	**5**	**1323.2**	**877.3**
2nd high with coal	88	6	14	1	22	3.60	282.6	5	2869.9	54.0
2nd high with coal	88	6	14	2	51	1.54	282.6	6	2924.4	54.0
2nd high with coal	88	6	14	3	190	2.57	279.8	6	2978.9	54.0
2nd high with coal	88	6	14	4	194	0.00	280.4	7	3033.3	54.0
2nd high with coal	88	6	14	5	155	1.54	279.8	6	24.2	77.8
2nd high with coal	88	6	14	6	182	1.54	282.0	5	419.1	466.7
2nd high with coal	88	6	14	7	177	0.00	284.8	4	813.9	855.7
2nd high with coal	88	6	14	8	182	2.57	288.2	3	1208.8	1244.6
2nd high with coal	88	6	14	9	318	1.54	291.5	2	1603.7	1633.5
2nd high with coal	88	6	14	10	174	3.60	294.3	2	1998.5	2022.4
2nd high with coal	88	6	14	11	168	3.60	297.6	2	2393.4	2411.3
2nd high with coal	88	6	14	12	173	5.66	299.8	3	2788.3	2800.2
2nd high with coal	88	6	14	13	167	5.14	299.8	3	3183.1	3189.1
2nd high with coal	88	6	14	14	157	5.14	300.9	3	3578.0	3578.0
2nd high with coal	88	6	14	15	165	5.14	301.5	3	3578.0	3578.0
2nd high with coal	88	6	14	16	174	4.63	301.5	3	3578.0	3578.0
2nd high with coal	88	6	14	17	179	3.60	302.0	3	3578.0	3578.0
2nd high with coal	88	6	14	18	236	3.09	301.5	3	3578.0	3578.0
2nd high with coal	88	6	14	19	255	3.09	300.4	4	3578.0	3578.0
2nd high with coal	88	6	14	20	247	3.60	297.0	4	3578.0	3578.0
2nd high with coal	88	6	14	21	290	3.09	294.3	5	3619.3	2753.2
2nd high with coal	88	6	14	22	175	1.54	292.0	6	3664.2	1855.4

TABLE B-1
METEOROLOGIC DATA FOR DAYS WITH MAXIMUM PREDICTED IMPACTS FROM NON-ROAD SOURCES

2nd high with coal	88	6	14	23	11	3.09	289.3	6	3709.1	957.7
2nd high with coal	88	6	14	24	173	3.09	288.7	6	3754.1	60.0
2nd high with coal Average					**176**	**3.00**	**292.2**	**4**	**2751.3**	**1899.6**
6th high with coal	88	7	16	1	26	5.66	295.9	4	2150.7	2150.7
6th high with coal	88	7	16	2	28	5.66	295.4	4	2150.0	2150.0
6th high with coal	88	7	16	3	50	4.63	293.2	5	2149.3	351.0
6th high with coal	88	7	16	4	39	4.12	291.5	5	2148.7	351.0
6th high with coal	88	7	16	5	61	4.63	289.8	5	2148.0	351.0
6th high with coal	88	7	16	6	43	5.14	290.4	4	197.9	516.5
6th high with coal	88	7	16	7	55	6.17	292.6	4	440.9	719.7
6th high with coal	88	7	16	8	71	6.69	294.3	4	684.0	922.9
6th high with coal	88	7	16	9	72	6.69	295.4	4	927.0	1126.1
6th high with coal	88	7	16	10	71	6.69	297.0	4	1170.0	1329.3
6th high with coal	88	7	16	11	79	5.14	298.7	3	1413.0	1532.4
6th high with coal	88	7	16	12	76	5.14	300.4	3	1656.0	1735.6
6th high with coal	88	7	16	13	76	6.17	302.0	3	1899.0	1938.8
6th high with coal	88	7	16	14	75	5.66	303.7	3	2142.0	2142.0
6th high with coal	88	7	16	15	56	5.66	304.8	3	2142.0	2142.0
6th high with coal	88	7	16	16	47	7.20	305.4	4	2142.0	2142.0
6th high with coal	88	7	16	17	56	7.72	305.9	4	2142.0	2142.0
6th high with coal	88	7	16	18	66	6.17	304.8	4	2142.0	2142.0
6th high with coal	88	7	16	19	75	6.17	303.2	4	2142.0	2142.0
6th high with coal	88	7	16	20	52	5.14	300.4	4	2142.0	2142.0
6th high with coal	88	7	16	21	42	5.66	298.7	4	2136.3	2136.3
6th high with coal	88	7	16	22	40	4.63	295.9	5	2130.5	1153.2
6th high with coal	88	7	16	23	18	7.72	297.0	4	2124.6	2124.6
6th high with coal	88	7	16	24	13	3.60	294.8	5	2118.8	150.0
6th high with coal Average					**54**	**5.74**	**298.0**	**4**	**1776.6**	**1488.9**
2nd high without coal	87	5	7	1	24	0.00	283.2	7	4236.2	81.0
2nd high without coal	87	5	7	2	118	2.06	282.6	6	4241.3	81.0
2nd high without coal	87	5	7	3	232	2.57	280.9	6	4246.5	81.0
2nd high without coal	87	5	7	4	341	2.06	283.2	6	4251.6	81.0
2nd high without coal	87	5	7	5	283	3.09	281.5	6	4256.7	81.0
2nd high without coal	87	5	7	6	277	0.00	279.3	5	311.2	386.3
2nd high without coal	87	5	7	7	285	0.00	284.8	4	810.2	875.9
2nd high without coal	87	5	7	8	282	0.00	288.7	3	1309.2	1365.5
2nd high without coal	87	5	7	9	276	0.00	292.0	2	1808.1	1855.1
2nd high without coal	87	5	7	10	284	0.00	295.4	1	2307.1	2344.7
2nd high without coal	87	5	7	11	278	0.00	298.2	1	2806.1	2834.3
2nd high without coal	87	5	7	12	236	2.57	300.9	1	3305.1	3323.8
2nd high without coal	87	5	7	13	147	4.12	302.0	2	3804.0	3813.4
2nd high without coal	87	5	7	14	124	4.63	302.6	3	4303.0	4303.0
2nd high without coal	87	5	7	15	159	2.57	302.6	2	4303.0	4303.0
2nd high without coal	87	5	7	16	126	4.63	302.6	3	4303.0	4303.0
2nd high without coal	87	5	7	17	128	5.66	302.0	4	4303.0	4303.0
2nd high without coal	87	5	7	18	129	4.63	300.9	3	4303.0	4303.0
2nd high without coal	87	5	7	19	146	2.57	299.3	4	4303.0	4303.0
2nd high without coal	87	5	7	20	259	3.09	294.8	5	4233.4	3845.0
2nd high without coal	87	5	7	21	21	2.06	292.6	6	4089.9	2899.8
2nd high without coal	87	5	7	22	358	4.12	289.8	5	3946.3	1954.5

TABLE B-1
METEOROLOGIC DATA FOR DAYS WITH MAXIMUM PREDICTED IMPACTS FROM NON-ROAD SOURCES

2nd high without coal	87	5	7	23	356	0.00	289.3	6	3802.7	1009.3
2nd high without coal	87	5	7	24	173	2.57	285.9	6	3659.1	64.0
2nd high without coal Average					**210**	**2.21**	**292.3**	**4**	**3468.4**	**2199.8**
6th high without coal	88	7	22	1	29	5.14	294.3	5	2609.2	23.0
6th high without coal	88	7	22	2	59	4.63	290.4	5	2569.1	23.0
6th high without coal	88	7	22	3	278	3.09	288.7	6	2528.9	23.0
6th high without coal	88	7	22	4	277	2.57	289.3	6	2488.7	23.0
6th high without coal	88	7	22	5	14	4.63	290.9	5	2448.6	23.0
6th high without coal	88	7	22	6	8	0.00	291.5	4	173.4	194.5
6th high without coal	88	7	22	7	15	1.54	295.9	3	412.6	431.1
6th high without coal	88	7	22	8	62	2.57	299.8	3	651.8	667.6
6th high without coal	88	7	22	9	88	5.14	300.4	3	891.0	904.2
6th high without coal	88	7	22	10	74	7.20	302.0	4	1130.2	1140.8
6th high without coal	88	7	22	11	74	7.20	303.7	4	1369.4	1377.3
6th high without coal	88	7	22	12	77	6.17	305.4	3	1608.6	1613.9
6th high without coal	88	7	22	13	65	6.17	307.6	3	1847.8	1850.4
6th high without coal	88	7	22	14	75	7.72	308.7	3	2087.0	2087.0
6th high without coal	88	7	22	15	64	8.23	309.3	4	2087.0	2087.0
6th high without coal	88	7	22	16	75	8.75	309.3	4	2087.0	2087.0
6th high without coal	88	7	22	17	71	8.23	308.7	4	2087.0	2087.0
6th high without coal	88	7	22	18	75	6.17	307.6	4	2087.0	2087.0
6th high without coal	88	7	22	19	69	6.17	305.4	4	2087.0	2087.0
6th high without coal	88	7	22	20	39	3.60	299.8	5	2087.6	2062.9
6th high without coal	88	7	22	21	29	5.66	298.7	4	2100.9	2100.9
6th high without coal	88	7	22	22	29	5.66	297.0	4	2114.2	2114.2
6th high without coal	88	7	22	23	33	5.66	295.4	4	2127.5	2127.5
6th high without coal	88	7	22	24	30	4.12	293.7	5	2140.8	20.0
6th high without coal Average					**71**	**5.25**	**299.7**	**4**	**1825.9**	**1218.4**
Grand Average					**114**	**4.78**	**293.2**	**4**	**2229.1**	**1536.8**

TABLE B-2
METEOROLOGIC DATA FOR DAYS WITH MAXIMUM PREDICTED IMPACTS FROM ROAD FUGITIVE DUST EMISSIONS

Rank	Yr	Mo	Da	Hr	Vector	Wind Speed, m/s	Temp	Stability	Rural Mixing Height	Urban Mixing Height
1st high	89	1	26	1	192	2.57	255.9	4.0	438.0	438.0
1st high	89	1	26	2	195	2.57	255.4	5.0	450.0	134.0
1st high	89	1	26	3	208	2.57	253.1	6.0	462.1	134.0
1st high	89	1	26	4	208	1.54	253.7	6.0	474.2	134.0
1st high	89	1	26	5	184	1.54	253.1	6.0	486.3	134.0
1st high	89	1	26	6	196	1.54	253.1	6.0	498.4	134.0
1st high	89	1	26	7	203	0.00	253.7	6.0	510.4	134.0
1st high	89	1	26	8	226	1.54	253.1	5.0	4.8	137.7
1st high	89	1	26	9	233	0.00	254.3	4.0	103.2	213.9
1st high	89	1	26	10	234	0.00	255.9	3.0	201.5	290.1
1st high	89	1	26	11	252	2.06	257.0	3.0	299.9	366.4
1st high	89	1	26	12	206	3.09	260.9	3.0	398.3	442.6
1st high	89	1	26	13	236	2.57	261.5	3.0	496.6	518.8
1st high	89	1	26	14	212	3.09	263.1	3.0	595.0	595.0
1st high	89	1	26	15	226	3.60	263.1	3.0	595.0	595.0
1st high	89	1	26	16	210	4.12	262.6	4.0	595.0	595.0
1st high	89	1	26	17	215	3.60	262.0	4.0	595.0	595.0
1st high	89	1	26	18	201	2.57	258.7	5.0	585.8	554.2
1st high	89	1	26	19	234	2.06	258.1	6.0	568.3	477.1
1st high	89	1	26	20	208	2.06	258.7	6.0	550.9	400.1
1st high	89	1	26	21	206	0.00	258.1	7.0	533.4	323.1
1st high	89	1	26	22	206	0.00	257.6	7.0	516.0	246.1
1st high	89	1	26	23	184	2.57	255.9	6.0	498.6	169.0
1st high	89	1	26	24	248	2.06	255.4	6.0	481.1	92.0
1st high Average					**213**	**1.97**	**257.3**	**4.9**	**455.7**	**327.2**
2nd high	91	1	31	1	254	1.54	258.7	6.0	622.3	175.0
2nd high	91	1	31	2	208	1.54	259.3	6.0	606.4	175.0
2nd high	91	1	31	3	212	0.00	258.7	6.0	590.5	175.0
2nd high	91	1	31	4	241	2.57	259.8	5.0	574.7	175.0
2nd high	91	1	31	5	243	0.00	259.3	6.0	558.8	175.0
2nd high	91	1	31	6	227	2.57	259.8	5.0	542.9	175.0
2nd high	91	1	31	7	215	2.57	259.8	5.0	527.1	175.0
2nd high	91	1	31	8	212	0.00	260.4	4.0	8.6	180.0
2nd high	91	1	31	9	206	0.00	262.0	3.0	76.5	219.3
2nd high	91	1	31	10	224	3.09	264.8	3.0	144.4	258.7
2nd high	91	1	31	11	228	3.09	265.9	3.0	212.3	298.0
2nd high	91	1	31	12	226	4.12	268.1	3.0	280.2	337.3
2nd high	91	1	31	13	247	4.12	269.3	3.0	348.1	376.7
2nd high	91	1	31	14	244	4.12	270.9	3.0	416.0	416.0
2nd high	91	1	31	15	239	4.12	271.5	3.0	416.0	416.0
2nd high	91	1	31	16	266	2.57	270.9	4.0	416.0	416.0
2nd high	91	1	31	17	268	0.00	269.8	3.0	416.0	416.0
2nd high	91	1	31	18	199	3.60	267.6	4.0	413.0	413.0
2nd high	91	1	31	19	246	2.57	265.9	5.0	406.0	333.1
2nd high	91	1	31	20	269	1.54	265.4	6.0	398.9	274.7
2nd high	91	1	31	21	271	0.00	264.3	6.0	391.9	216.3
2nd high	91	1	31	22	288	1.54	264.3	7.0	384.8	157.8

TABLE B-2
METEOROLOGIC DATA FOR DAYS WITH MAXIMUM PREDICTED IMPACTS FROM ROAD FUGITIVE DUST EMISSIONS

Rank	Yr	Mo	Da	Hr	Vector	Wind Speed, m/s	Temp	Stability	Rural Mixing Height	Urban Mixing Height
2nd high	91	1	31	23	256	4.12	263.7	6.0	377.8	99.4
2nd high	91	1	31	24	263	2.06	263.7	6.0	370.7	41.0
2nd high Average					**240**	**2.14**	**264.3**	**4.6**	**395.8**	**253.9**
6th high	88	12	12	1	149	0.00	271.5	4.0	348.6	348.6
6th high	88	12	12	2	159	2.06	270.9	4.0	341.6	341.6
6th high	88	12	12	3	216	1.54	270.9	5.0	334.5	446.0
6th high	88	12	12	4	237	2.06	270.4	4.0	327.5	327.5
6th high	88	12	12	5	250	2.06	270.4	4.0	320.4	320.4
6th high	88	12	12	6	259	2.57	269.8	4.0	313.4	313.4
6th high	88	12	12	7	236	2.57	269.3	4.0	306.3	306.3
6th high	88	12	12	8	240	3.60	269.8	4.0	299.3	299.3
6th high	88	12	12	9	237	3.09	269.3	4.0	292.2	292.2
6th high	88	12	12	10	236	3.09	269.3	3.0	285.2	285.2
6th high	88	12	12	11	269	1.54	270.9	2.0	278.1	278.1
6th high	88	12	12	12	149	1.54	271.5	2.0	271.1	271.1
6th high	88	12	12	13	210	3.09	271.5	3.0	264.0	264.0
6th high	88	12	12	14	235	4.12	272.0	4.0	257.0	257.0
6th high	88	12	12	15	232	3.09	272.0	4.0	257.0	257.0
6th high	88	12	12	16	249	3.60	272.0	4.0	257.0	257.0
6th high	88	12	12	17	212	2.57	270.9	5.0	256.9	258.6
6th high	88	12	12	18	263	2.57	269.3	5.0	256.1	270.3
6th high	88	12	12	19	257	0.00	269.3	4.0	255.3	255.3
6th high	88	12	12	20	230	2.57	269.3	4.0	254.5	254.5
6th high	88	12	12	21	239	2.57	269.8	4.0	253.7	253.7
6th high	88	12	12	22	225	2.57	269.8	4.0	252.9	252.9
6th high	88	12	12	23	212	2.57	269.8	4.0	252.1	252.1
6th high	88	12	12	24	265	2.06	269.3	4.0	251.3	251.3
6th high Average					**228**	**2.38**	**270.4**	**3.9**	**282.8**	**288.1**
Grand Average					**227**	**2.16**	**264.0**	**4.5**	**378.1**	**289.7**